Claims

[c1] 1. An apparatus for controlling pressure in a regulated alternating pressure support surface having a plurality of cells, comprising:

an alternating pressure support surface having at least a first and second set of cells;

a pressure control system for each set of cells, further comprising:

pump means to supply pressure to the sets of cells;

sensing means to measure pressure in the set of cells; and

means to adjust the pressure in the set of cells based on the pressure measured by the sensing means;

means to alternate pressure in each set of cells such that when the first set of cells is inflated, the second set of cells is deflated, and when the first set of cells is deflated, the second set of cells is inflated;

means to detect the cross over pressure in the first and second sets of cells; and

means to selectably set the cross over pressure in the first and second sets of cells.

[c2] 2. An apparatus, as in claim 1, further comprising:

a timer to control inflation and deflation of the first and second set of cells such that they inflate and deflate on a periodic basis.

[c3] 3. An apparatus, as in claim 2, wherein the timer is adjustable.

[c4] 4. An apparatus, as in claim 2, wherein the first or second set of cells, when deflated, have an internal pressure less than or equal to 3 mmHg.

[c5] 5, An apparatus, as in claim 1, further comprising:
a DC power source;
means to adjust the output of the DC power source; and
comparison means to compare the adjusted output of the DC power source with the pressure measured by the sensing means and produce an output error signal, the comparison means producing a control signal that indicates whether pump output is to be changed.

[c6] 6. An apparatus, as in claim 5, wherein:
the control signal output by the comparison means is used to control pump output pressure such that cross over pressure is dynamically maintained at a preselected level.

[c7] 7. An apparatus, as in claim 6, further comprising a timer to control inflation and deflation of the first and second set of cells such that they inflate and deflate on a periodic basis.

[c8] 8. An apparatus, as in claim 7, wherein the timer is adjustable.

[c9] 9. An apparatus, as in claim 8, wherein the first or second set of cells, when deflated, have an internal pressure less than or equal to 3 mmHg.

[c10] 10. A method of avoiding pressure wounds in alternating pressure support surfaces, including the steps of:
providing an alternating support surface that has at least two sets of cells, the sets of cells arranged such that when one set of cells is inflated, and the other set of cells is deflated, the inflated set of cells provides sufficient pressure to support the weight of a patient; and
periodically deflating the inflated cells and inflating the deflated cells.

[c11] 11. A method, as in claim 10, including the additional steps of:
measuring the output pressure of a pump used to inflate the cells; and
comparison means to compare the measured output pressure with a selectable input control value, and adjusting the pump output pressure under control of the selectable input control value.

[c12] 12. A method, as in claim 10, including the additional step of using a servo-loop circuit to compare the output pump pressure with a selectable DC control voltage, and adjusting pump output levels based on the value of the selectable DC control voltage.

[c13] 13. A method, as in claim 12, including the additional step of adjusting the output pump pressure to set cross over pressure to a predetermined level.

[c14] 14. A method, as in claim 12, including the additional step of adjusting the output pump pressure such that when a set of cells is deflated, its internal pressure is less than or equal to 3 mmHg.

[c15] 15. A method, as in claim 13, including the additional step of adjusting the output pump pressure such that when a set of cells is deflated, its internal pressure is less than or equal to 3 mmHg.

[c16] 16. A method, as in claim 12, including the additional step of using a timer to control switching of the sets of cells between deflated and inflated states after a predetermined time interval.

[c17] 17. An apparatus for controlling pressure in a regulated alternating pressure support surface having a plurality of cells, comprising:

an alternating pressure support surface having at least a first and second set of cells;

pump means to supply pressure to the sets of cells;

sensing means to measure pressure in the set of cells; and

means to adjust the pressure in the set of cells based on the pressure measured by the sensing means;

means to alternate pressure in each set of cells such that when the first set of cells is inflated, the second set of cells is deflated, and when the first set of cells is deflated, the second set of cells is inflated.

[c18] 18. An apparatus, as in claim 17, further comprising:

means to detect the cross over pressure in the sets of cells; and

means to selectably control pump output pressure, based on the detected cross over pressure, to adjust the cross over pressure in the sets of cells to a preselected level.

[c19] 19. An apparatus, as in claim 18, further comprising:

means to visually display the detected cross over pressure; and

means to manually control pump output pressure, based on the visually display the detected cross over pressure, such that the cross over pressure in the sets of cells is set to a selectable level.

[c20] 20. An apparatus, as in claim 19, wherein the sets of cells, when deflated, have an internal pressure less than or equal to 3 mmHg.